

ABSTRACT

DISSERTATION: SPATIAL, TEMPORAL, AND ECOLOGICAL CORRELATES OF
MORPHOLOGICAL VARIATION AMONG NORTH AMERICAN FRESHWATER FISHES

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This dissertation outlines the contribution of evolutionary and environmental factors on North American freshwater fish morphological variation. A more thorough understanding of the factors which result in morphological variation is essential to describing patterns of evolutionary diversification, distribution, ecological niche, ontogeny, sexual dimorphism, ecosystem role, community assembly, invasion dynamics, and conservation. This dissertation makes a unique contribution to understanding morphological diversity in freshwater fishes by linking intraspecific and interspecific variation to phylogeny, allometry, sex, habitat niche, geographic niche, hydrology, and long term environmental change. This dissertation is comprised of three chapters which detail large scale macroevolutionary patterns in morphological variation for North American freshwater fishes, long term morphological changes with hydrological alterations in Cyprinidae, and phenotypic plasticity of freshwater drum in the Wabash River. Overall, North American fishes tend to be deeper bodied and more robust with larger body size, in females, in low flow and lentic hydrological conditions, and in taxa with smaller geographic range that occupy more specialized habitat niches. Further, macroevolutionary analysis suggests that the majority of morphological diversification occurred relatively early on in the evolutionary history of North American fishes.